
Area-Wide Soil Contamination Toolbox

Overview

[Placeholder for introductory text describing what area-wide soil contamination is and provide context for how this toolbox should be used. Cover sheets could also be appended to address the concerns and needs of specific audiences (e.g., childcare providers, gardeners, etc.).]

In this toolbox, you'll find:

1. Background information on area-wide soil contamination.
2. Maps and contextual information describing the location and extent of area-wide soil contamination in Washington. This information is organized according to the three main sources of area-wide soil contamination:
 - historical smelter emissions,
 - historical use of lead arsenate pesticides, and
 - emissions from past use of leaded gasoline.
3. Tools for conducting assessments of individual properties to determine whether there is the potential for exposure to elevated levels of lead and arsenic in soil. These tools include:
 - lead arsenate contamination flowchart,
 - qualitative assessment checklist, and
 - sampling guidance for child-use areas, residential properties, and commercial properties.
4. Information on health risks from exposure to low-to-moderate levels of arsenic and lead in soil.
5. Examples of best management practices (BMPs) individuals can use to limit exposure to arsenic and lead in soil. In particular, BMPs are designed to minimize the potential for exposure of children, gardeners, and other adults who frequently work in soil. This toolbox contains example BMPs developed by the following organizations:
 - Public Health – Seattle & King County
 - Snohomish Health District
 - Washington State University, Agricultural Extension
6. Information describing the range of protective measures that might be taken to respond to area-wide soil contamination.
7. Contact information for Federal, State, and local agencies that are available to answer questions and provide additional help.

1. What is Area-Wide Soil Contamination?

[Placeholder to insert background information on area-wide soil contamination and the issues it raises.]

2. Maps of Area-Wide Soil Contamination Areas

Soil in many areas of Washington State has elevated levels of arsenic and lead from historical smelter emissions, historical use of lead arsenate pesticides, and past use of leaded gasoline. Areas where elevated levels of arsenic and lead are more likely to be present may be identified based on their proximity to these historical sources. Maps show a greater or lesser probability of encountering elevated levels of arsenic and lead in soil based on proximity to historical sources. For certainty, individual property assessments are needed.

The Task Force recommends a tiered approach to providing information on the nature and extent of contamination, as follows.

- › Tier 1: Tier 1 maps identify the general areas in the state where elevated levels of arsenic and lead soil contamination are more likely to be present based on historical smelter emissions and historical use of lead arsenate pesticides. This tier is designed to raise awareness in the widest possible audience about the location of area-wide soil contamination in Washington and to help users decide whether to look at the second tier of more detailed maps and informational tools for more information.
- › Tier 2: Tier 2 maps allow individuals to refine their understanding of where area-wide soil contamination is likely to be present based on more detailed, smaller scale maps of smelter plumes and historical orchard areas. For sources such as leaded gasoline and lead arsenate pesticides where local maps do not exist, other information and tools are provided to help individuals determine whether elevated levels of arsenic and lead contamination are likely to be present based on the location and land-use history of specific properties.

Areas Affected by Smelter Emissions

Tier 1 Smelter Map

The tier 1 state smelter map (*Figure 1: Areas Potentially Affected by Historical Smelter Emissions, Based on Data Available as of January 2003*) shows the portions of counties where area-wide soil contamination is likely to be present based on the historical emissions from four former smelter areas in Washington, based on information currently available. This figure identifies the historical locations of smelters in Washington and shows the portions of counties potentially affected by smelter emissions in a darker color.

The areas indicated as potentially affected by smelter emissions do not necessarily include all affected areas, because the complete extent of effects has not been determined. The areas shown were derived from actual soil sampling results for the Tacoma and Harbor Island smelters, sampling and air modeling for the Everett smelter, and maps of sulfur dioxide injury to vegetation from the Northport and Trail, BC smelters. These regions include areas where arsenic and lead levels are likely to exceed cleanup levels (as shown in the Tier 2 smelter maps for most of the smelters described below) as well as other areas where air modeling or other information indicated that some level of impact from smelter emissions exists. Only the Tacoma smelter plume area has been fully characterized by sampling; the total areas affected by the Harbor Island, Northport/Trail, and Everett smelters have not been fully characterized.

Figure 1: Areas Potentially Affected
by Historical Smelter Emissions
Based on Data Available as of January 2003



Tier 2 Smelter Maps

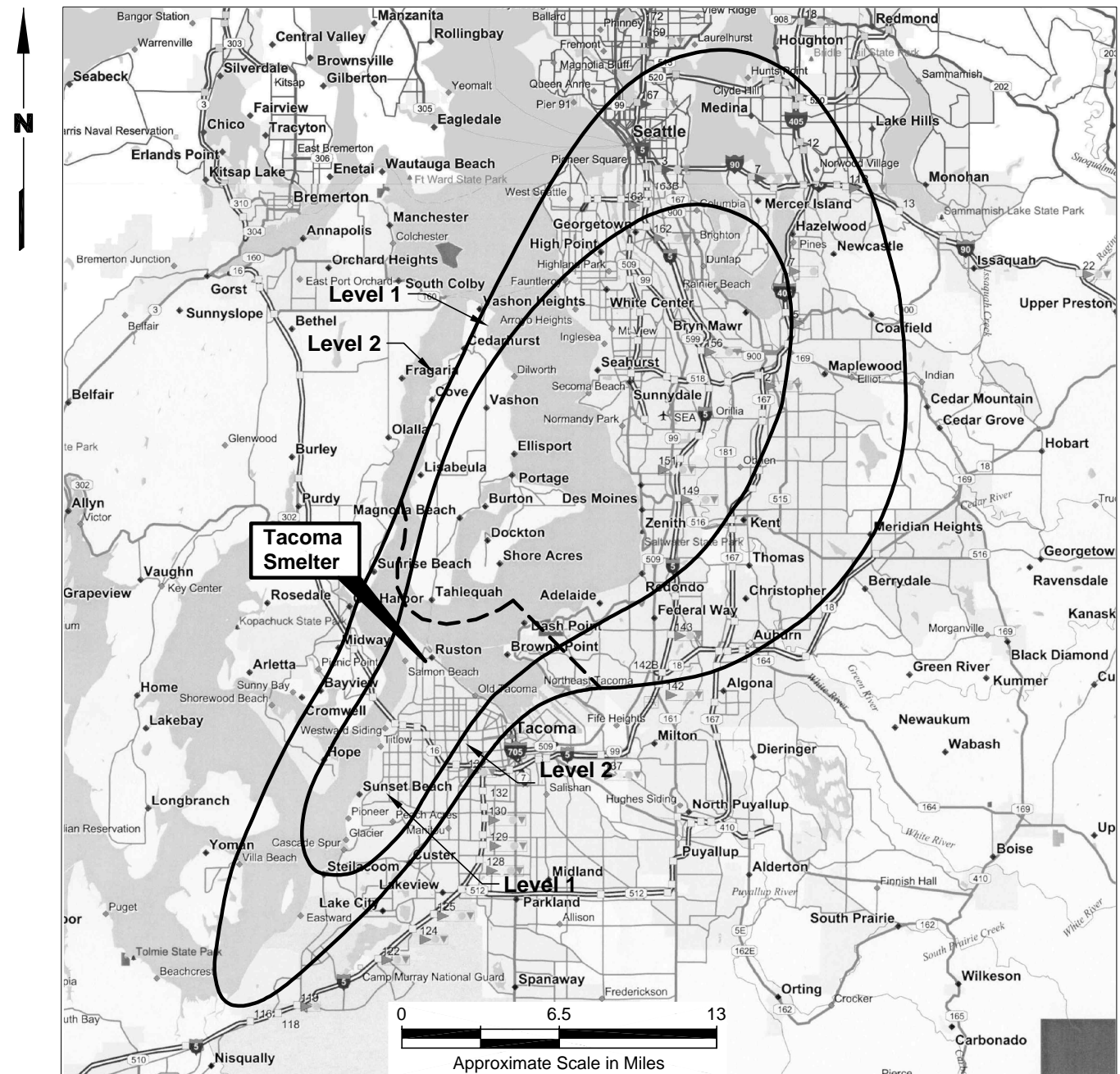
More detailed, local maps have been developed to delineate the potential extent of arsenic and lead soil contamination from smelter emissions for the following smelter areas:

- › *Figure 2: Map of the Area Affected by Emissions from the Tacoma Smelter with Wind Rose Diagram of Predominant Wind Directions at the Smelter Site, Based on Data Available as of January 2003*
- › *Figure 3: Map of the Area Affected by Emissions from the Everett Smelter with Wind Rose Diagram of Predominant Wind Directions at the Smelter Site, Based on Data Available as of January 2003*
- › *Figure 4: Map of the Area Affected by Emissions from the Harbor Island Smelter with Wind Rose Diagram of Predominant Wind Directions at the Smelter Site, Based on Data Available as of January 2003*
- › *Figure 5: Area Potentially Affected by Emissions from the Northport and Trail, BC Smelters, Based on Data Available as of January 2003*

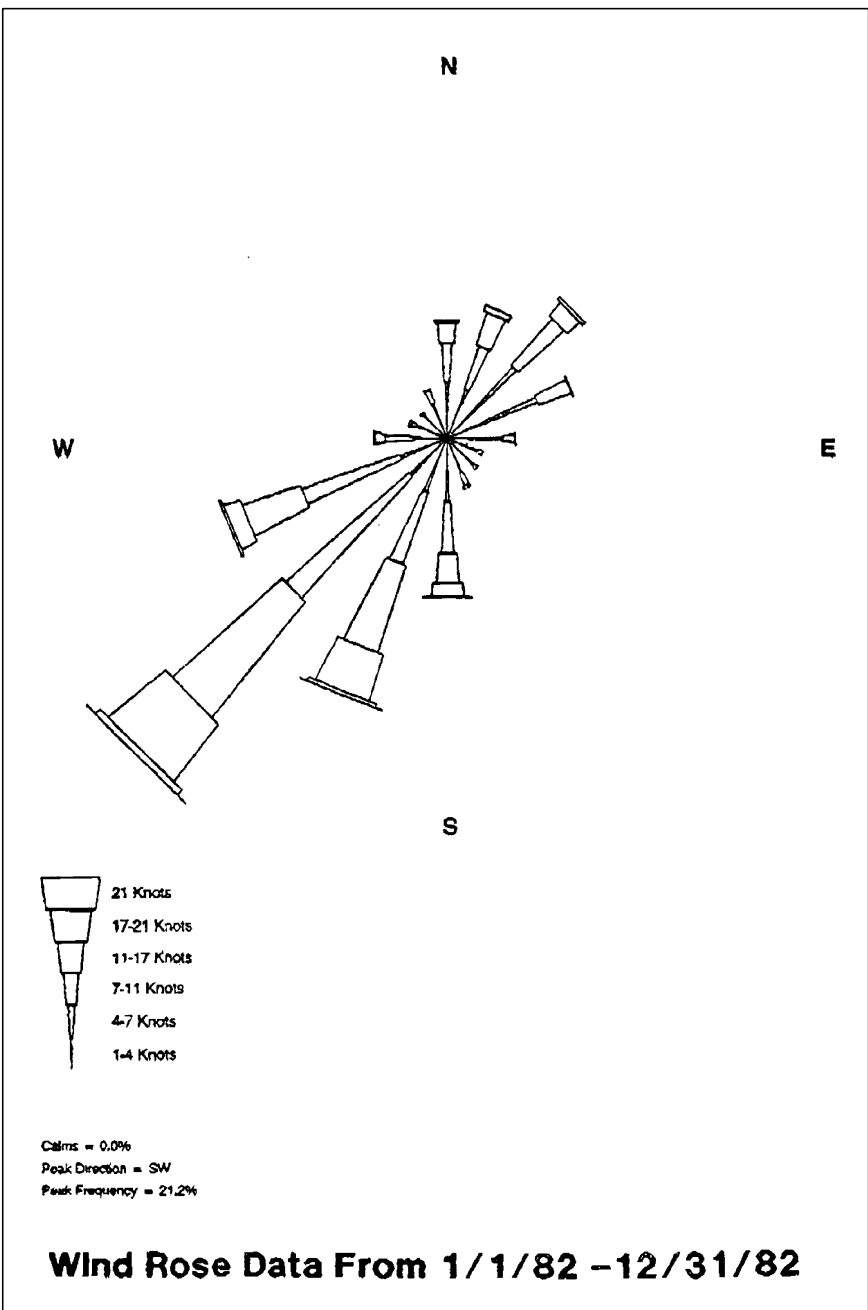
Tacoma, Harbor Island, and Everett Smelters

For the Tacoma, Harbor Island, and Everett smelters, the figures show the extent of area known to be likely to contain elevated levels of arsenic and lead (above 20 mg/kg for arsenic or above 250 mg/kg for lead) based on soil sampling results. The Tacoma and Everett smelter plume maps also show the larger areas potentially affected by smelter emissions (including areas where arsenic and lead levels may occasionally exceed cleanup levels). All three Westside smelter figures include wind-rose diagrams illustrating the predominant wind patterns around the smelters.

Figure 2: Map of the Area Affected by Emissions from the Tacoma Smelter with Wind Rose Diagram of Predominant Wind Directions at the Smelter Site Based on Data Available as of January 2003



Adapted from: Delorme Street Atlas USA, 2000



Source: Asarco Information Center
Station Location: Tacoma Smelter

Legend

Level 1: Area Where Shallow Undisturbed Soil Likely Exceeds 20 mg/kg Arsenic

Level 2: Area Where Shallow Undisturbed Soil Occasionally Exceeds 20 mg/kg Arsenic

Data Sources:
Ecology, 2002
Glass, 2002

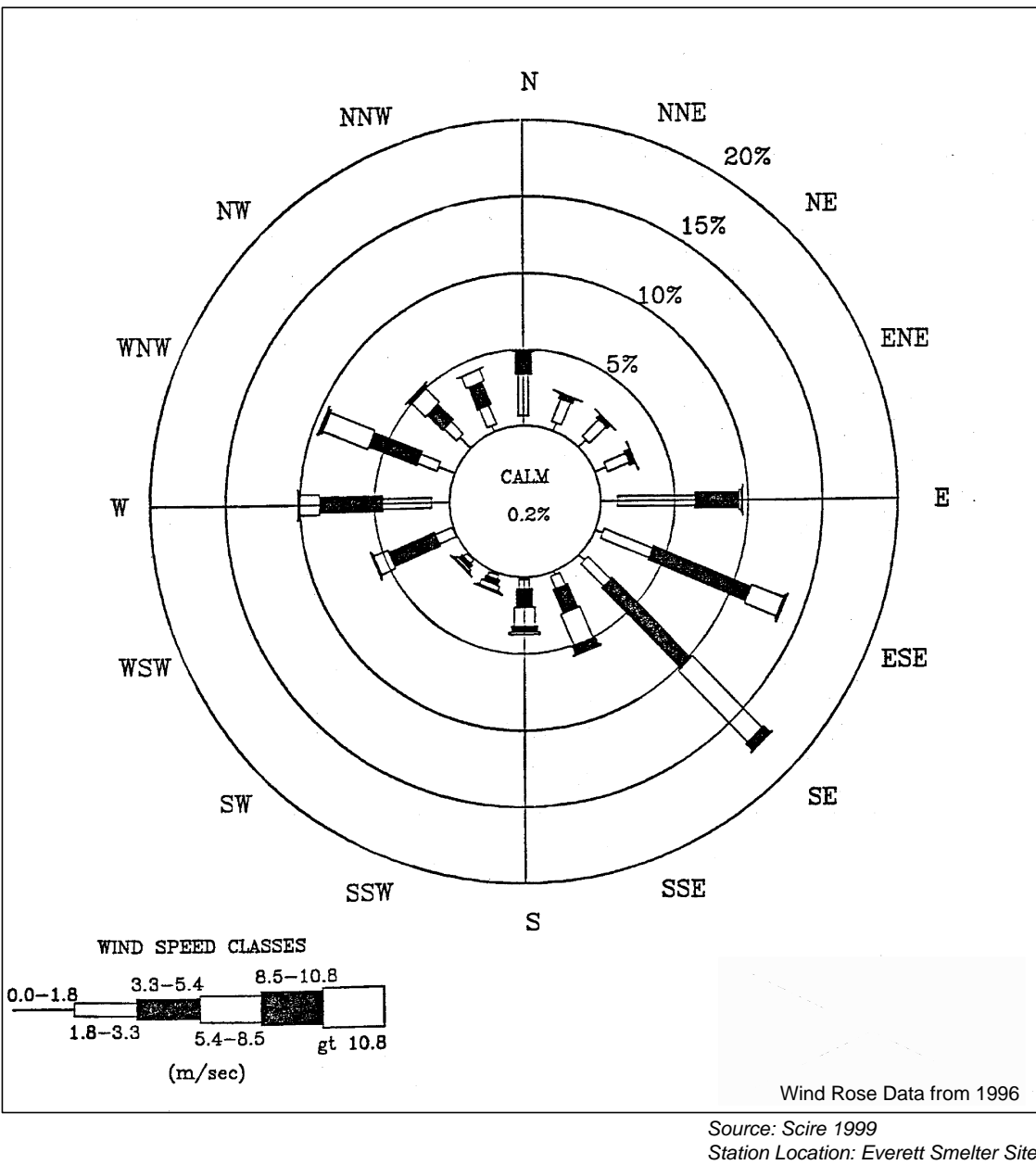
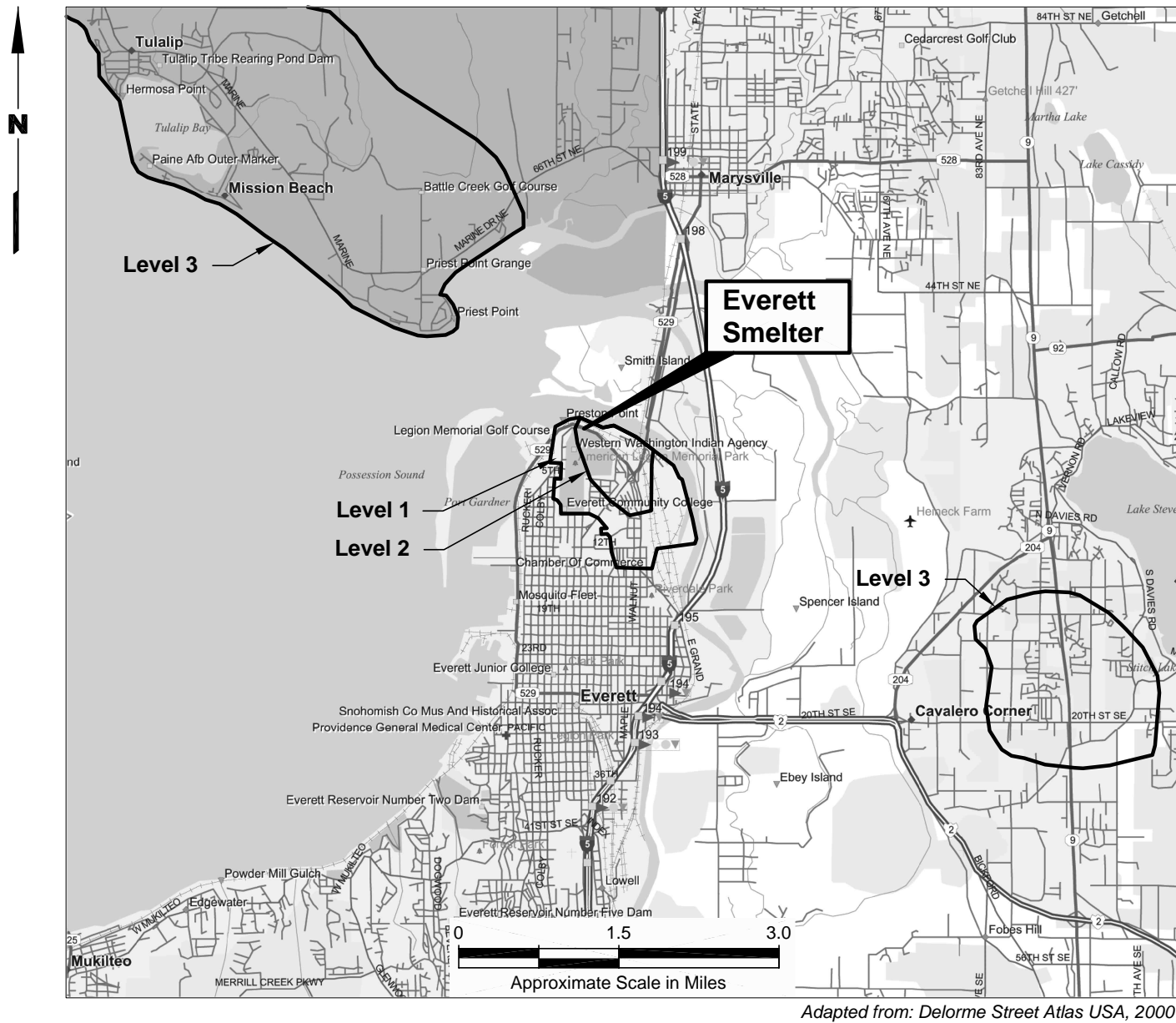
Interpreting a Wind Rose

A wind rose is a quantitative graphical summary of the wind direction and speed for a given time. The wind rose graph shows the number of hours (expressed as a percentage) that the wind blew from a particular direction and speed. The wind rose spokes or arms represent 16 points of the compass and are labeled by wind direction. The percentage of time the wind blew from a given direction is expressed by percentage for that direction on the perimeter of each rose. The length of each segment of a spoke represents the percentage of time the wind speed was within a specific speed interval for a particular direction (the longer the spoke, the greater the time that the wind blew from that direction). If summed for all wind directions, the result would provide the percentage of all hours the wind speed was measured within a specific interval. The percentage of time when the winds were light and variable is shown in the center of the rose.

Disclaimer

The map of the area affected by smelter emissions was originally developed in 2003 for the Landau Associates report "Preliminary Estimates, Area-wide Contamination Strategy, Washington State". They are based on information available at that time and are intended to provide a general indication of where elevated levels of arsenic and lead in soil may be present due to historical smelter emissions, so individuals and communities can assess whether to look into additional information on area-wide soil contamination. Additional information on area-wide soil contamination, including information on actions individuals can take to better understand the potential for elevated levels of arsenic and lead at individual properties and to minimize the potential that they will be exposed to arsenic and lead, is available at [www.asarco.com](#). Not all of the areas identified on the map will actually have elevated levels of arsenic and lead in soil. This map should not substitute for a site-specific assessment.

Figure 3: Map of the Area Affected by Emissions from the Everett Smelter
with Wind Rose Diagram of Predominant Wind Directions at the Smelter Site
Based on Data Available as of January 2003



Legend

- Level 1: Area Where Shallow Soil Likely Exceeds 20 mg/kg Arsenic
- Level 2: Area Where Shallow Soil Occasionally Exceeds 20 mg/kg Arsenic
- Level 3: Area Where Modeling Predicted Most Likely Particulate Deposition From Former Furnace Stack

Data Sources:
Ecology, 1999
Scire, 1999

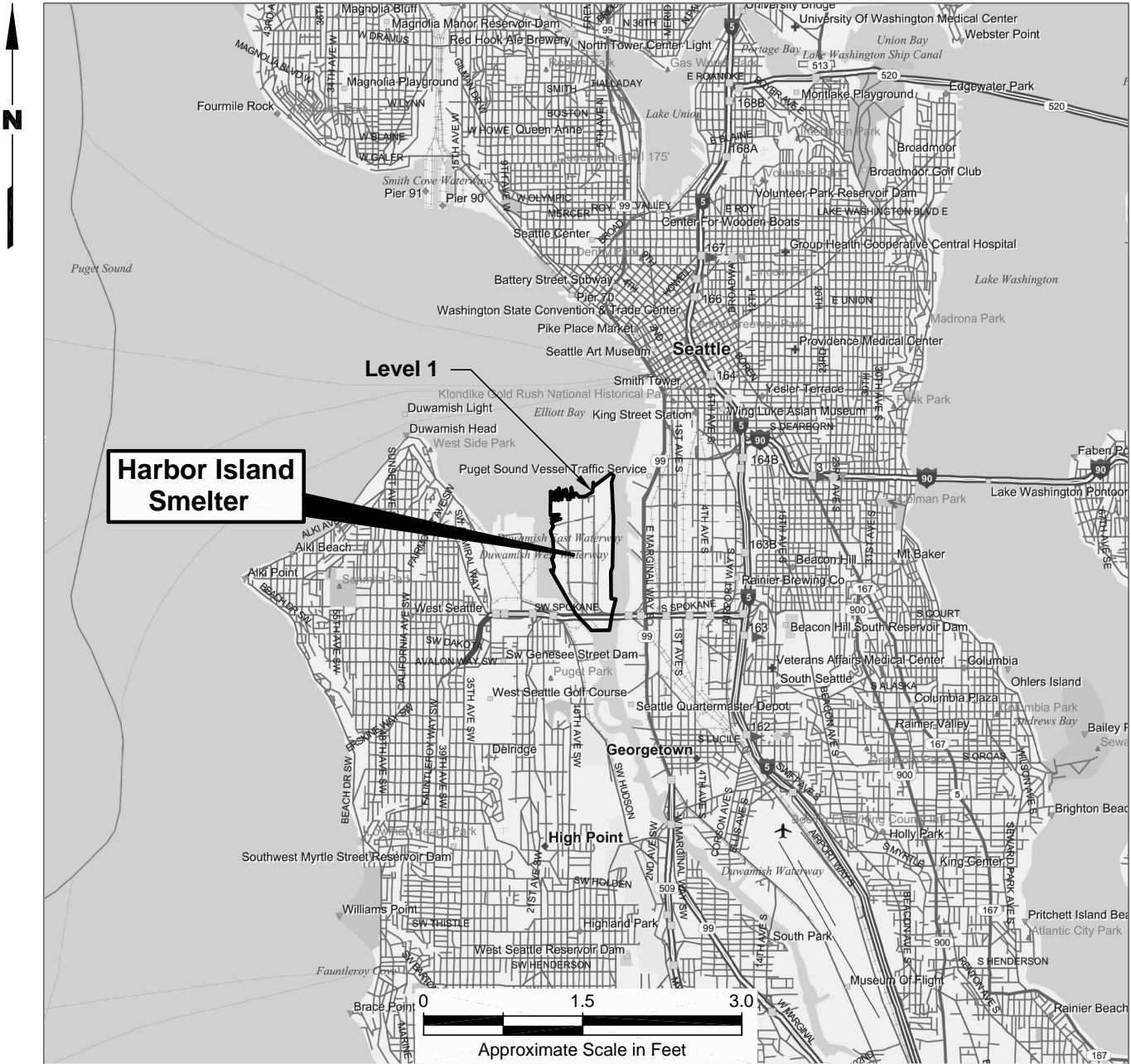
Interpreting a Wind Rose

A wind rose is a quantitative graphical summary of the wind direction and speed for a given time. The wind rose graph shows the number of hours (expressed as a percentage) that the wind blew from a particular direction and speed. The wind rose spokes or arms represent 16 points of the compass and are labeled by wind direction. The percentage of time the wind blew from a given direction is expressed by percentage for that direction on the perimeter of each rose. The length of each segment of a spoke represents the percentage of time the wind speed was within a specific speed interval for a particular direction (the longer the spoke, the greater the time that the wind blew from that direction). If summed for all wind directions, the result would provide the percentage of all hours the wind speed was measured within a specific interval. The percentage of time when the winds were light and variable is shown in the center of the rose.

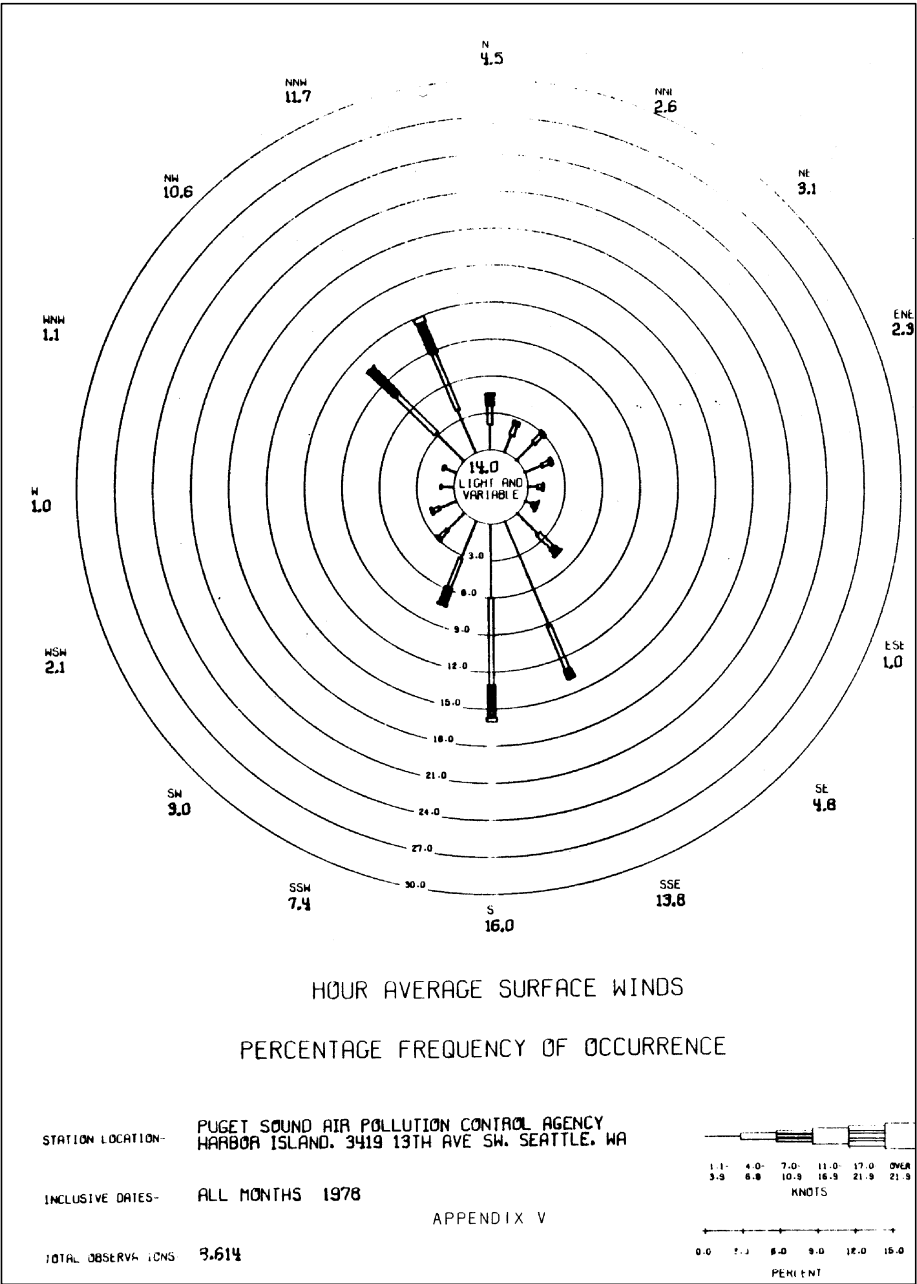
Disclaimer

The map of the area affected by smelter emissions was originally developed in 2003 for the Landau Associates report "Preliminary Estimates, Area-wide Contamination Strategy, Washington State". They are based on information available at that time and are intended to provide a general indication of where elevated levels of arsenic and lead in soil may be present due to historical smelter emissions, so individuals and communities can assess whether to look into additional information on area-wide soil contamination. Additional information on area-wide soil contamination, including information on actions individuals can take to better understand the potential for elevated levels of arsenic and lead at individual properties and to minimize the potential that they will be exposed to arsenic and lead, is available at [www.ehponline.org](#). Not all of the areas identified on the map will actually have elevated levels of arsenic and lead in soil. This map should not substitute for a site-specific assessment.

Figure 4: Map of the Area Affected by Emissions from the Harbor Island Smelter with Wind Rose Diagram of Predominant Wind Directions at the Smelter Site Based on Data Available as of January 2003



Adapted from: Delorme Street Atlas USA, 2000



Source: PSAPCA 1980
Station Location: Harbor Island

Legend

Level 1: Area Where
Shallow Soil Likely
Exceeds 250 mg/kg
Lead

Data Source:
Weston, 1993

Interpreting a Wind Rose

A wind rose is a quantitative graphical summary of the wind direction and speed for a given time. The wind rose graph shows the number of hours (expressed as a percentage) that the wind blew from a particular direction and speed. The wind rose spokes or arms represent 16 points of the compass and are labeled by wind direction. The percentage of time the wind blew from a given direction is expressed by percentage for that direction on the perimeter of each rose. The length of each segment of a spoke represents the percentage of time the wind speed was within a specific speed interval for a particular direction (the longer the spoke, the greater the time that the wind blew from that direction). If summed for all wind directions, the result would provide the percentage of all hours the wind speed was measured within a specific interval. The percentage of time when the winds were light and variable is shown in the center of the rose.

Disclaimer

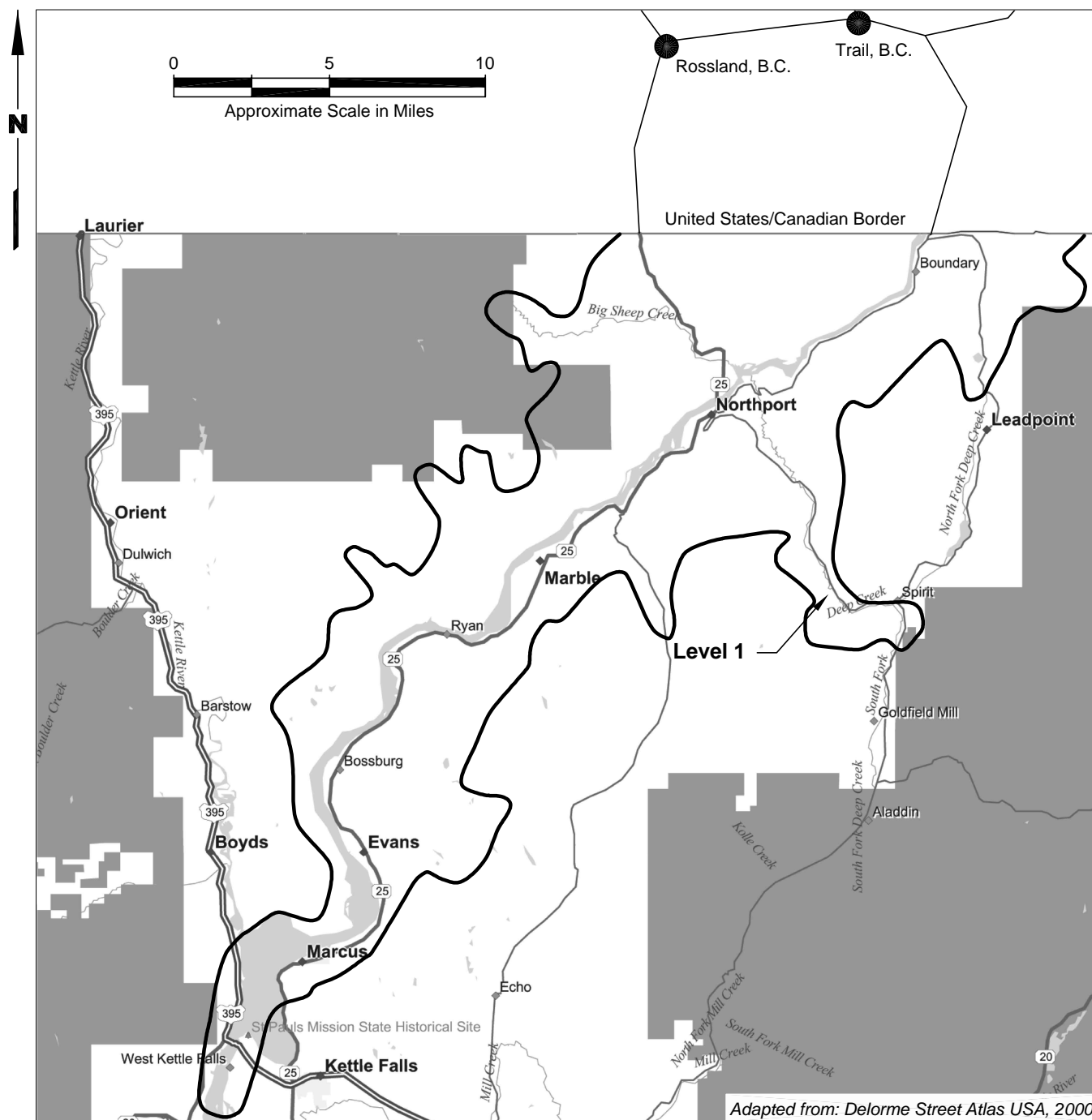
The map of the area affected by smelter emissions was originally developed in 2003 for the Landau Associates report "Preliminary Estimates, Area-wide Contamination Strategy, Washington State". They are based on information available at that time and are intended to provide a general indication of where elevated levels of arsenic and lead in soil may be present due to historical smelter emissions, so individuals and communities can assess whether to look into additional information on area-wide soil contamination. Additional information on area-wide soil contamination, including information on actions individuals can take to better understand the potential for elevated levels of arsenic and lead at individual properties and to minimize the potential that they will be exposed to arsenic and lead, is available at [www.wa.gov/health/contamination](#). Not all of the areas identified on the map will actually have elevated levels of arsenic and lead in soil. This map should not substitute for a site-specific assessment.

Northport and Trail, BC Smelters

For the Northport and Trail smelters (Figure 5), the area potentially affected by smelter emissions has been estimated based on observed effects of sulfur dioxide emissions from the smelters, rather than soil sampling results for arsenic and lead, since soil sampling data do not exist for the area outside the Northport smelter property. The area of potential impact from Northport smelter emissions has been identified based on evaluation of another smelter emission contaminant, sulfur dioxide, and the maximum extent of injury to trees from this contaminant observed and documented in 1929. The area of arsenic and lead soil contamination from smelter emissions is assumed to approximate the same area as that affected by sulfur dioxide emissions, since the emissions occurred together.

Along with emissions from the Northport smelter, the area has also been affected by the Trail smelter, located approximately 18 miles upriver from the Northport smelter in the West Kootenay region of British Columbia. Smoke from Trail has reportedly been detected at Kettle Falls, Washington, 50 miles south along the river. As shown in Figure 6, the defined area of potential impact from both smelters is influenced by the local topography. The deep valley of the Columbia River where the Northport and Trail smelters are located provides a channel which influences air dispersion, in part by limiting wind direction along the axis of the river, with the prevailing winds carrying smoke from Trail down the Columbia River valley past Northport.

**Figure 5: Area Potentially Affected by Emissions
from the Northport and Trail, BC Smelters
Based on Data Available as of January 2003**



Adapted from: Delorme Street Atlas USA, 2000

Legend

Level 1: Area Where
Smelter Smoke Damage
to Vegetation
Documented in 1929.
Damage Attributed to
SO₂ Emissions.
Source: After Wirth,
2000

 Colville National
Forest

Disclaimer

This figure was originally developed in 2003 for the report "Preliminary Estimates, Area-wide Contamination Strategy, Washington State" by Landau Associates. It is based on information available at that time and is intended to provide a general indication of where elevated levels of arsenic and lead in soil may be present due to historical smelter emissions, so individuals and communities can assess whether to look into

additional information on area-wide soil contamination. Additional information on area-wide soil contamination, including information on actions individuals can take to better understand the potential for elevated levels of arsenic and lead at individual properties and to minimize the potential that they will be exposed to arsenic and lead, is available at _____.

Not all of the areas identified on the map will actually have elevated levels of arsenic and lead in soil. This map should not substitute for a site-specific assessment.

The area potentially affected by smelter emissions is only shown for Washington State, not Canada.

Areas Affected by Lead Arsenate Pesticides

Tier 1 Lead Arsenate Pesticides Maps

Although data currently available do not permit the development of a state map of areas affected by lead arsenate contamination comparable to the tier 1 smelter map, agricultural and land-use data are available to provide a general indication of the distribution of lead arsenate pesticide contamination based on where apple and pear trees were located historically. The Task Force recommends that the following state map be used to show the total acreage of land potentially affected by lead arsenate pesticide use in each county.

- › *Figure 6: County Acreage Potentially Affected by Historical Use of Lead Arsenate Pesticide.* This map shows the area of land potentially affected by historical use of lead arsenate pesticide in each county based upon the peak-year acreage of apple and pear trees in each county over the period from 1905 to 1947, when lead arsenate pesticides were generally used. Table 1 (below) lists these peak-year apple and pear tree acreages for each county and compares the total area potentially affected by lead arsenate pesticide use based on peak-year apple and pear tree acreages to the total area of each county and the total amount of private land in each county.

Although data are not available to precisely delineate areas affected by lead arsenate in all counties, certain general areas in the State may be assumed to have low probability of lead arsenate contamination based on their location or land use. The Task Force recommends that local tier 1 maps such as the following examples be developed to show the general locations of areas potentially affected by lead arsenate contamination within individual counties, based on available land-use information such as elevation and public lands.

- › *Figures 7-9 [in development]: Areas Potentially Affected by Historical Use of Lead Arsenate Pesticide in Chelan, Okanogan, and Yakima Counties.* These maps show areas in these counties that are below 2,500 feet in elevation and are not public lands. In general, Federal and State public lands and high elevation areas (above about 2,500 feet) are unlikely to have had apple and pear trees grown on them, and, therefore, are less likely to have been affected by past use of lead arsenate pesticide.

The lead arsenate pesticide flowchart and the tier 2 lead arsenate pesticide maps provide additional information and a guide for determining whether individual properties are likely to have lead arsenate contamination.

DRAFT

Table 1: Total Areas Potentially Affected by Lead Arsenate Pesticide Contamination by County and Proportions of Total Land and Private Land Potentially Affected by County

County	Total County Acreage	Public Land Acreage	Percent Public Land (%)	Private Land Acreage	Apple Tree Acreage	Pear Tree Acreage	Total Tree Fruit Acreage	Percent of County Affected (%)	Percent of Private Land Affected (%)
Adams	1,235,072	80,728	6.5	1,154,344	454	82	536	0.04	0.05
Asotin	409,262	108,814	26.6	300,448	420	81	501	0.12	0.17
Benton	1,122,809	352,563	31.4	770,246	6,616	1,122	7,738	0.69	1.00
Chelan	1,915,838	1,695,939	88.5	219,899	26,288	4,175	30,463	1.59	13.85
Clallam	1,141,042	719,834	63.1	421,208	299	32	331	0.03	0.08
Clark	410,999	75,462	18.4	335,537	1,973	703	2,676	0.65	0.80
Columbia	556,220	182,342	32.8	373,878	1,053	108	1,161	0.21	0.31
Cowlitz	731,478	128,115	17.5	603,363	1,001	138	1,139	0.16	0.19
Douglas	1,179,695	165,502	14.0	1,014,193	6,777	690	7,467	0.63	0.74
Ferry	1,450,915	1,246,545	85.9	204,370	306	16	322	0.02	0.16
Franklin	807,391	97,656	12.1	709,735	302	12	314	0.04	0.04
Garfield	459,852	113,200	24.6	346,652	590	159	749	0.16	0.22
Grant	1,786,503	425,765	23.8	1,360,738	4,532	396	4,928	0.28	0.36
Grays Harbor	1,235,289	490,589	39.7	744,700	370	55	425	0.03	0.06
Island	137,021	14,310	10.4	122,711	561	44	605	0.44	0.49
Jefferson	1,162,696	924,553	79.5	238,143	291	33	324	0.03	0.14
King	1,403,508	631,641	45.0	771,867	2,308	392	2,700	0.19	0.35
Kitsap	255,339	41,354	16.2	213,985	843	126	969	0.38	0.45
Kittitas	1,494,741	1,019,122	68.2	475,619	1,545	97	1,642	0.11	0.35
Klickitat	1,212,167	238,612	19.7	973,555	4,157	475	4,632	0.38	0.48
Lewis	1,564,211	669,023	42.8	895,188	1,769	185	1,954	0.12	0.22
Lincoln	1,496,674	127,984	8.6	1,368,690	1,544	275	1,819	0.12	0.13
Mason	620,305	235,033	37.9	385,272	371	45	416	0.07	0.11
Okanogan	3,402,402	2,630,253	77.3	772,149	9,565	1,043	10,608	0.31	1.37
Pacific	597,842	99,369	16.6	498,473	215	23	238	0.04	0.05
Pend Oreille	910,089	613,346	67.4	296,743	210	12	222	0.02	0.07
Pierce	1,080,110	462,343	42.8	617,767	1,873	266	2,139	0.20	0.35
San Juan	110,755	13,721	12.4	97,034	1,206	201	1,407	1.27	1.45
Skagit	1,127,231	657,007	58.3	470,224	828	113	941	0.08	0.20
Skamania	1,072,343	955,884	89.1	116,459	699	1,677	2,376	0.22	2.04
Snohomish	1,345,933	831,391	61.8	514,542	1,148	522	1,670	0.12	0.32
Spokane	1,138,013	74,600	6.6	1,063,413	18,995	460	19,455	1.71	1.83
Stevens	1,623,630	666,365	41.0	957,265	3,350	192	3,542	0.22	0.37
Thurston	471,338	95,381	20.2	375,957	849	226	1,075	0.23	0.29
Wahkiakum	165,146	44,341	26.8	120,805	182	13	195	0.12	0.16
Walla Walla	825,730	34,516	4.2	791,214	2,613	479	3,092	0.37	0.39
Whatcom	1,390,935	984,655	70.8	406,280	1,616	332	1,948	0.14	0.48
Whitman	1,393,456	43,240	3.1	1,350,216	6,000	819	6,819	0.49	0.51
Yakima	2,757,047	2,144,184	77.8	612,863	35,857	22,193	58,050	2.11	9.47

Sources: Data on historical apple and pear tree acreages from the Washington State Agricultural Census for the period 1905-1947; data on public land areas from the Washington State Department of Ecology's database on state and federal public lands in Washington.

Figure 6: County Acreage Potentially Affected by Historical Use of Lead Arsenate Pesticide



Legend

1,948 Number of Total Acres in the County Potentially Affected by Past Use of Lead Arsenate Pesticide on Apple and Pear Orchards

Disclaimer

This map was developed in 2003 to support the Area-Wide Soil Contamination Task Force. It is based on information available at that time and is intended to provide a general indication of where elevated levels of arsenic and lead in soil may be present due to historical use of lead arsenate pesticides, so individuals and communities can assess whether to look in to additional information on area-wide soil contamination.

Additional information on area-wide soil contamination, including information on actions individuals can take to better understand the potential for elevated levels of arsenic and lead at individual properties and to minimize the potential that they will be exposed to arsenic and lead, is available at _____.

Not all of the areas identified on the map will actually have elevated levels of arsenic and lead in soil. This map should not substitute for a site-specific assessment.

Tier 2 Lead Arsenate Pesticide Maps

More detailed, tier 2 maps for lead arsenate pesticide contamination can be developed for counties or portions of counties to further delineate areas where elevated levels of arsenic and lead may be present. These areas have not been as extensively sampled as areas within smelter plumes in the state, but local jurisdictions or other institutions may use resources such as historical aerial photos to roughly identify the former locations of orchards within a region. These locations can then be matched with information known about the current uses of the property (e.g., whether the property is a school, park, or in a residential area). The following two examples of tier 2 maps are included.

- › *Figure 10: Example Map of Historical Orchards in the Lake Chelan/Manson Area of Chelan County.* This figure consists of black and white aerial photographs of the Manson area near Lake Chelan that have been overlain in green with areas that used to be orchards in 1947. The historical orchard areas were identified based on an analysis of aerial photographs from 1947; they include all orchard areas, not simply apple and pear orchard areas, where lead and arsenic contamination from lead arsenate pesticide use is more likely.
- › *Figure 11: Example Map of Historical Orchards in Yakima County.* Similar to the above map but on a larger scale, this figure shows areas in Yakima County that were orchards in 1947, as determined based upon an analysis of historical aerial photographs. The Yakima County Planning Department developed this figure originally by entering the 1947 orchard areas into a GIS database and then mapping those historical orchard areas with the locations of city boundaries and highways within Yakima County.

Both of these maps were originally developed for other purposes, and should not be considered Task Force documents. However, wherever historical aerial photos are available in the state, it may be possible to produce similar tier 2 maps for other historical orchard areas. This type of tier 2 map may be useful to individuals and organizations, particularly as they attempt to focus on appropriate child-use areas where there may be exposure to arsenic and lead in soil. As a point of reference, Yakima County spent about \$35,000 and three months of staff time to develop a map of historical orchards in the county.

Figure 10: Example Map of Historical Orchards in the Lake Chelan/Manson Area of Chelan County

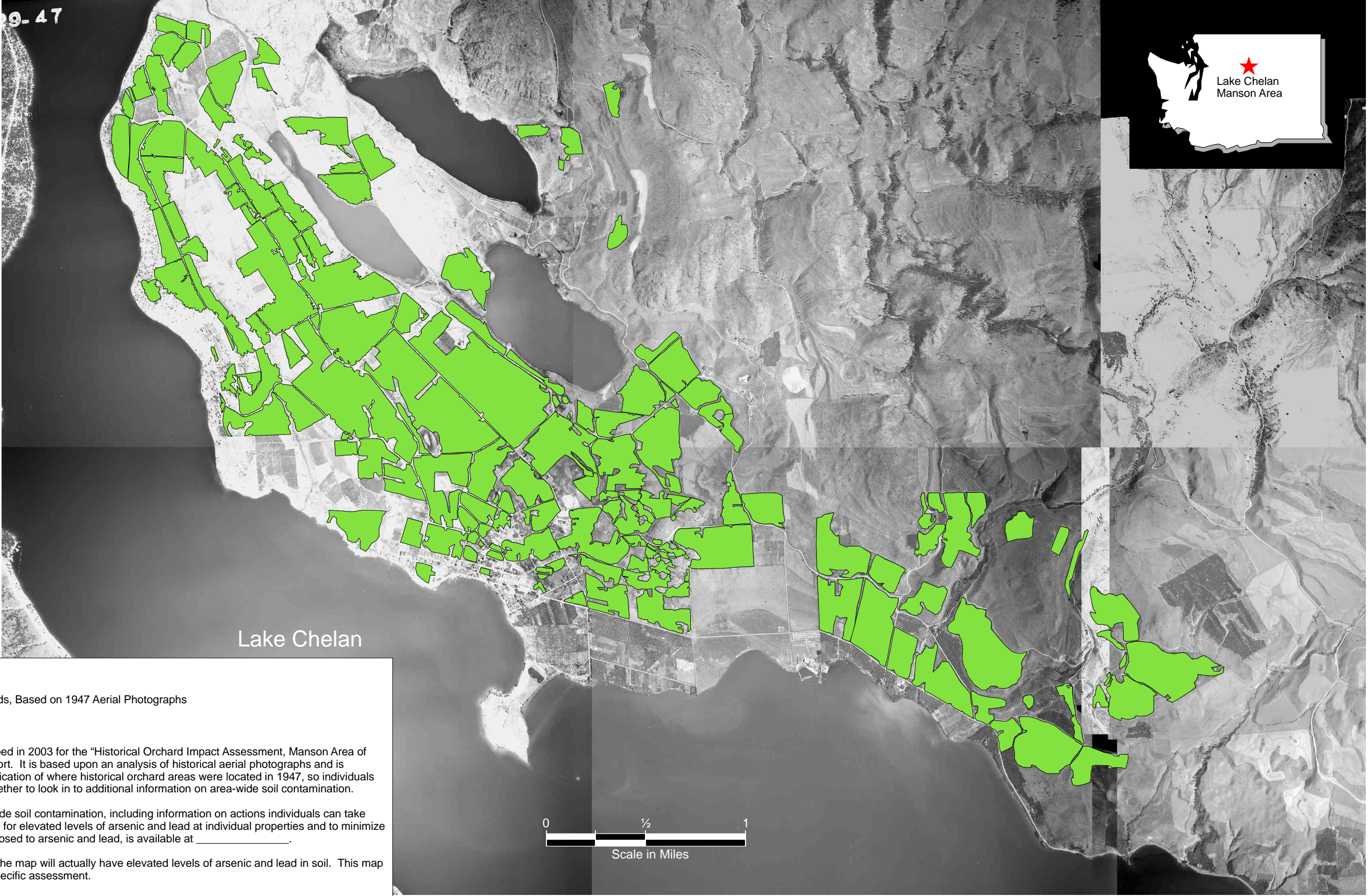
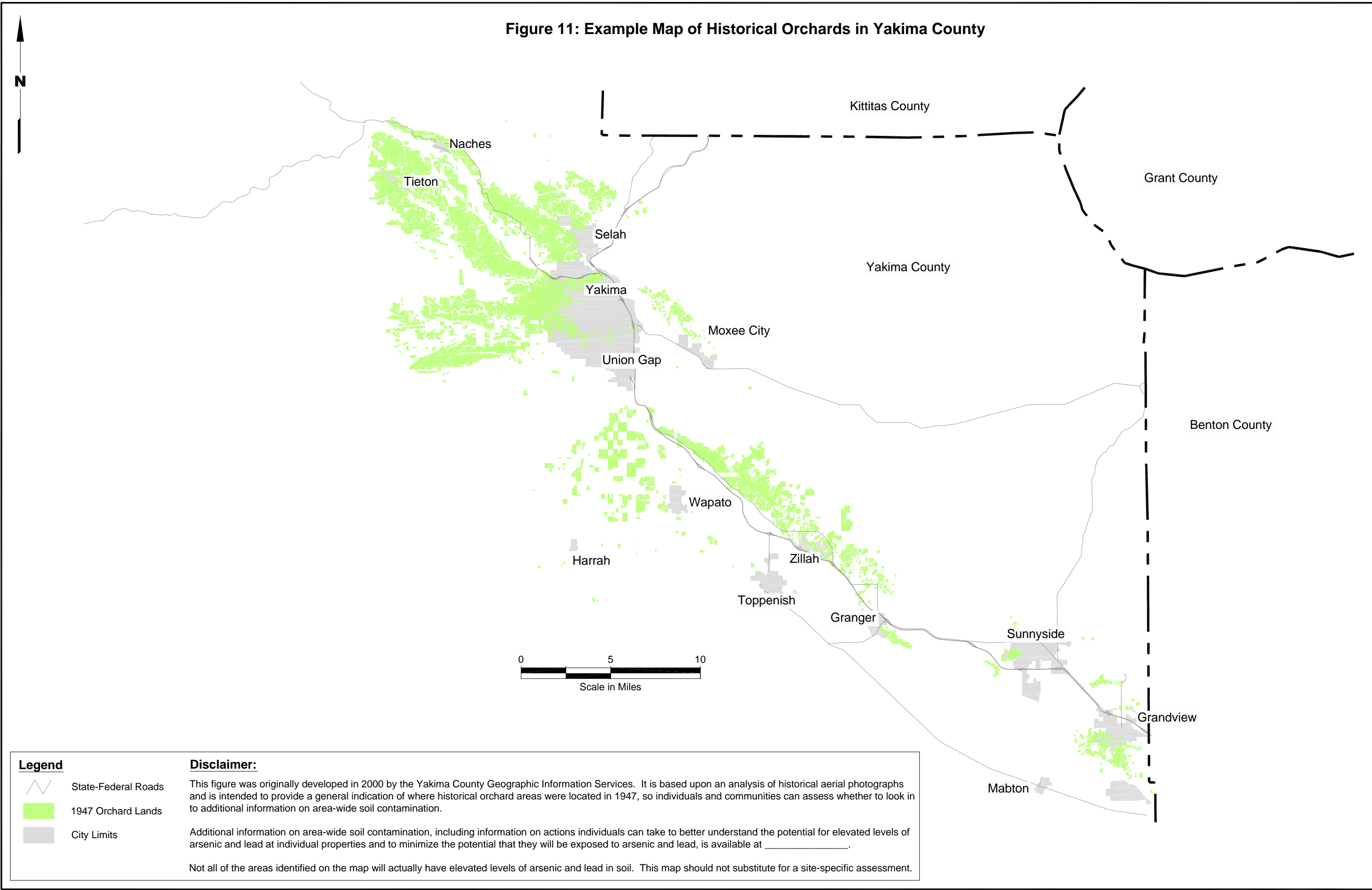


Figure 11: Example Map of Historical Orchards in Yakima County



Areas Affected by Leaded Gasoline Emissions

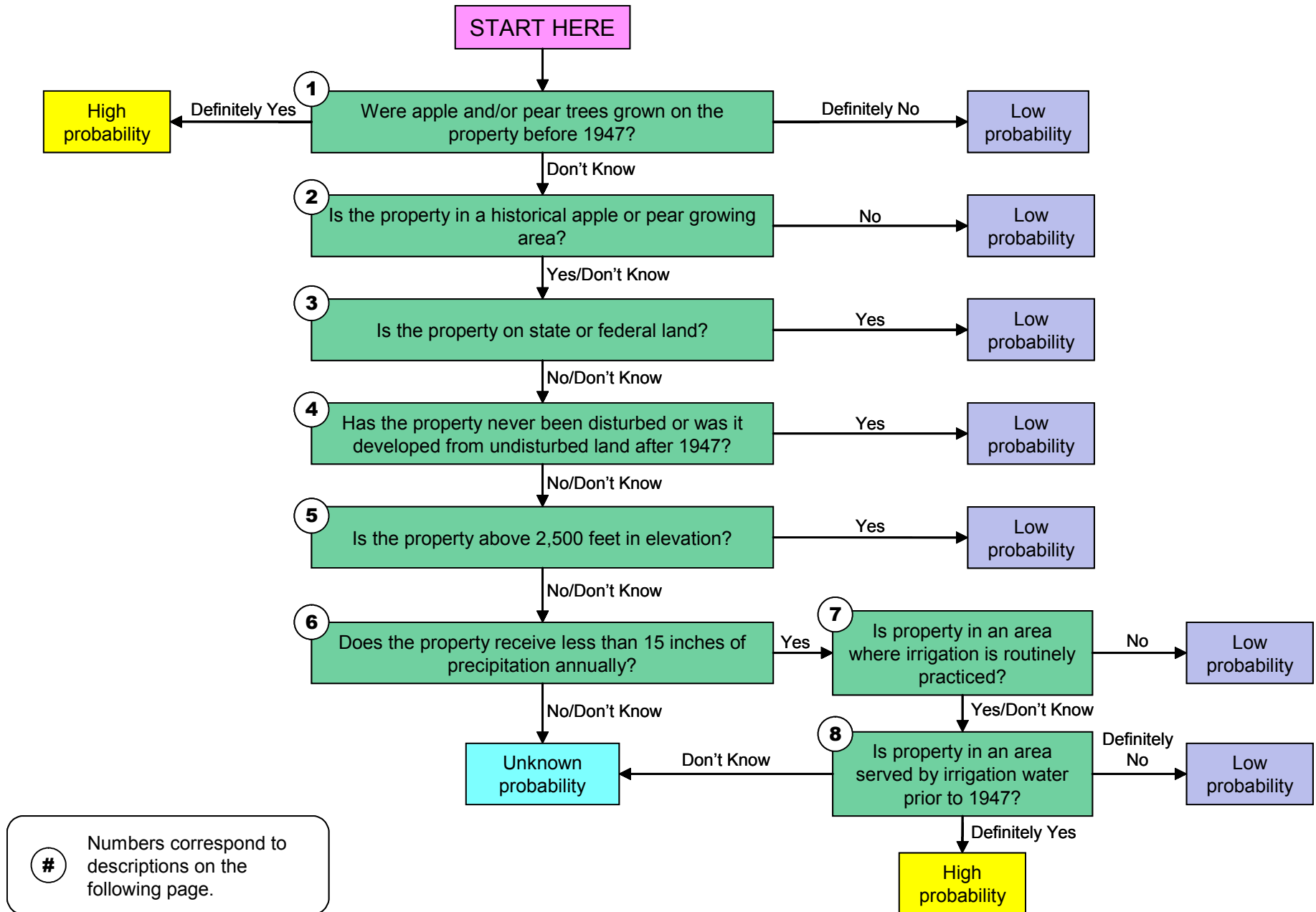
Many factors can influence the concentration of lead in soil adjacent to roadways from historical use of leaded gasoline. These factors include distance from the road, soil depth, traffic volume, traffic speed, whether the soil has been disturbed, and physical features of the location such as degree of vegetation, topography, average wind speed, and prevailing wind direction. In general, any road constructed before 1995 has potential for some contribution of lead to roadside soil. For any land parcel adjacent to a road that was present before 1995, the top foot of soil (soil surface to one foot below ground surface) within 25 feet of the edge of the road has the highest potential for containing soil lead contamination from past leaded gasoline emissions (assuming the soil bordering the road has not been disturbed). If the soil near the road edge has been disturbed, elevated levels of lead in soil may also be present below the top foot of soil or in areas where contaminated soil was moved.

3. Assessment Tools

[Placeholder to insert introductory text describing tools to conduct qualitative or quantitative assessments of individual properties.]

- › Lead Arsenate Contamination Flowchart
- › Draft Citizens' Qualitative Assessment Tool for Determining Potential Exposures to Lead and Arsenic Contamination
- › Sampling Guidance for Child-Use Areas, Residential Properties, and Commercial Properties

Lead Arsenate Pesticide Contamination Flowchart, Draft of 1/13/03



DRAFT

- 1 **Were apple and/or pear trees grown on the property before 1947?** Lead arsenate was used as a pesticide to control the codling moth from about 1905 to 1947 in Washington State. It was used most heavily on apple and pear trees, but was also applied to other tree fruit crops in smaller quantities. Properties that had apple or pear trees on them during the period when lead arsenate was used (i.e., before 1947) have a high probability of having elevated levels of arsenic and lead in soil, while properties that did not contain apple or pear trees have a low probability. Local planning and zoning departments, former property owners, and/or long-time residents of an area may have information about whether a particular property used to be an apple or pear orchard in the early to mid-1900s. The flowchart continues with additional questions if it is unclear whether apple or pear trees were grown on a property during the period when lead arsenate was used.
- 2 **Is the property in a historical apple or pear growing area?** Properties within historical apple or pear growing areas in the state—including but not limited to the Yakima valley, the Wenatchee valley, areas near Lake Chelan, areas in Okanogan and Spokane Counties, areas along the Columbia River, and in small commercial or “backyard” orchards in western Washington—are more likely to have contained apple and/or pear trees during the time when lead arsenate was used. If the property is not within a historical apple or pear growing area, the probability that it has elevated levels of arsenic and lead in soil from lead arsenate pesticide use is low. As with the first flowchart question, local planning and zoning departments, former property owners, and/or long-time residents of an area may have information about whether a particular property is within a historical apple or pear growing region.
- 3 **Is the property on state or federal land?** State and federal land is not likely to have been cultivated with apple or pear trees historically and therefore properties on state or federal land are less likely to be contaminated from lead arsenate pesticide use than are other properties.
- 4 **Has property never been disturbed or was it developed from undisturbed land after 1947?** Properties that have never been disturbed or that were developed from undisturbed land after 1947 would not have been cultivated with tree fruit crops during the time that lead arsenate pesticide was used, and therefore these properties have a low probability of having elevated levels of lead and arsenic in soil from historical use of lead arsenate. Former property owners, developers, and local officials may have information about the development history of properties.
- 5 **Is property above 2,500 feet in elevation?** Apple and pear trees tend to be grown in river valleys and other lower elevation areas in Washington. If a property is at a relatively high elevation, it is less likely to have had apple and pear trees grown on it during the early to mid 1900s, when lead arsenate was used as a pesticide, and therefore there is a low probability that elevated levels of arsenic and lead are present from historical lead arsenate use.
- 6 **Does the property receive less than 15 inches of precipitation annually?** This question is designed to separate the areas of the state that generally need irrigated water to grow apple and pear trees productively from those that do not. Information about average annual rainfall may be obtained from the National Weather Service.
 - In general, areas receiving more than 15 inches of precipitation annually, such as in much of western Washington, would not have needed to rely on irrigation to grow apple and pear trees; the flow chart ends for these properties with a determination of unknown probability of lead and arsenic contamination from lead arsenate use.
 - Areas in Washington that receive less than 15 inches of precipitation annually, however, would generally need irrigation to cultivate apple and pear trees productively; these areas are most often in eastern Washington. Information on current and historical irrigation practices, therefore, could help determine the likelihood of lead arsenate pesticide contamination. The flow chart continues for these properties with the following two additional questions about irrigation.
- 7 **Is the property in an area where irrigation is routinely practiced?** If the property is not located within a general area where irrigation has been routinely practiced, it is not likely to have been irrigated in the past. Since irrigation would have been necessary to grow apple or pear trees on the property because of its low annual precipitation, this implies that there is a low probability that elevated levels of arsenic and lead are present due to lead arsenate use. If, however, the property is in an irrigation area, the flow chart continues with the following question:
- 8 **Is the property in an area served by irrigation water prior to 1947?** If the property is in an area where irrigation is routinely practiced currently, information on whether the property was served by irrigation water before 1947, when lead arsenate pesticide use ended, can help determine whether there is high or low probability for arsenic and lead soil contamination from this source. Information on whether a property had been served by irrigated water historically may potentially be obtained by contacting local irrigation districts; County or City governments may also have maps or other historical references with this information.
 - If the property definitely was not served by irrigated water prior to 1947 yet (from question 6) is in an area needing irrigation to cultivate apple and pear trees, it is unlikely that apple and pear trees were grown on the property and therefore there is a low probability that there is lead arsenate contamination present.
 - If the property, however, was definitely irrigated in this period and (from question 2) is in a historical apple or pear growing area, there is a high probability that lead arsenate contamination is present.

Draft Citizens' Qualitative Assessment Tool for Determining Potential Exposures to Lead and Arsenic Contamination

The following questions may be used as part of a qualitative assessment of individual properties to determine whether children or adults may be routinely exposed to elevated levels of arsenic and lead in soil. These questions are designed to be useful to a broad range of audiences, including parents, teachers, daycare operators, parks officials, and schools administrators. Please visit and walk around the site, preferably during daylight hours, before answering the questions.

Q1. <i>Is the property near a historical smelter location in Pierce, King, Snohomish, or Stevens counties? (See maps of areas affected by historical smelter emissions in Washington.)</i>	If YES or UNSURE, elevated levels of arsenic and lead are likely to be present in soil, go to Q4. If NO, go to Q2.
Q2. <i>Were lead arsenate pesticides used on the property historically (e.g., on apple or pear trees)? (See lead arsenate contamination flowchart to determine whether elevated levels of arsenic and lead are likely to be present in soil.)</i>	If YES or LIKELY, go to Q4. If NO, go to Q3.
Q3. <i>Are portions of the property within 25 feet of a road built before 1995?</i>	If YES or UNSURE, there may be elevated levels of lead in soil from past use of leaded gasoline. Go to Q4. If NO, elevated levels of arsenic and lead are not likely to be present in soil.
Q4. <i>Do children routinely play in this area?</i>	If YES or UNSURE, go to Q7. If NO, go to Q5.
Q5: <i>Do people spend a lot of time in this area (e.g., while gardening)?</i>	If YES or UNSURE, go to Q7. If NO, go to Q6.
Q6: <i>Are there frequently used, unpaved paths or trails through this area?</i>	If YES or UNSURE, go to Q7. If NO, potential exposure to elevated levels of lead and arsenic in soil is less likely.
Q7: <i>Is there any exposed dirt in play and high use/traffic areas (e.g., swing sets, gardens, sports fields, lawns, and paths)?</i> Note: Asphalt, wood chips, grass cover, or other natural/synthetic barrier, if properly maintained, may help limit potential exposure to contaminated soil. The Consumer Product Safety Commission recommends that surfaces around playground equipment have at least 5-12 inches of wood chips, mulch, sand, or pea gravel, or are covered with mats made of safety-tested rubber or rubber-like materials.	If YES or UNSURE, there may be a higher potential for exposure to contaminated soils. Use best management practices (BMPs) to minimize potential exposure and determine whether to test soils. If NO, go to Q8.

Q8: *Would you expect soils to be exposed at any time during the year (e.g., due to seasonal sports or other activities)?*

If YES, there may be a higher potential for exposure to contaminated soils. Use best management practices (BMPs) to minimize potential exposure and determine whether to test soils.

If UNSURE, check with the landowner or organization responsible for maintaining the property to see whether a maintenance program is in place to ensure that play and high use/traffic areas remain thoroughly covered year round.

If NO, the potential for exposure to contaminated soils is less likely.

Area-Wide Soil Contamination Sampling Guidance

[Placeholder to insert or refer to sampling guidance for child-use areas, residential areas, and commercial properties.]

4. Health Risks Associated with Exposure to Low-to-Moderate Levels of Arsenic and Lead in Soil

[Placeholder to insert text describing health risks associated with exposure to low-to-moderate level arsenic and lead in soil, particularly the risks associated with childhood exposure, and information on how parents can obtain blood lead level screening for their children.]

5. Examples of Best Management Practices

[Placeholder to insert introductory text describing BMPs.]

- › Public Health – Seattle & King County’s Guidelines to Reduce Exposure to Contaminated Soils
- › Snohomish Health District’s Guidelines for Reducing Exposure at the Everett Smelter Site
- › Washington State University’s Gardening Guidelines

Public Health – Seattle & King County Guidelines to Reduce Exposure to Contaminated Soils

A recent study of area soils found arsenic and lead contamination at many points throughout King County. The Director of Public Health, Dr. Alonzo Plough, has determined that the lead and arsenic levels are of concern, but do not present an immediate health risk. As a precaution, people should avoid eating or breathing in contaminated dirt or dust. Children who crawl on the floor, play in dirt, and put hands and toys in their mouths are the most vulnerable. Public Health recommends that residents follow these guidelines to reduce exposure to contaminated soils:

Inside your home:

- › Take off your shoes before entering your home.
- › Wash hands and face thoroughly after working or playing in the soil, especially before eating.
- › Damp mop and wipe surfaces often to control dust.
- › Wash toddler toys and pacifiers often.
- › Scrub vegetables and fruits with soap and water.
- › Wash clothes dirtied by contaminated soil separately from other clothes.
- › Maintain painted surfaces in homes. Homes built before 1980 may contain lead-based paint. When older paint flakes it may become a source of lead.
- › Eat a balanced diet. Iron and calcium help keep lead from becoming a problem in the body.
- › Use water and soap to wash - avoid "waterless" soaps.

Outside your home:

- › Keep children from playing in contaminated dirt.
- › Cover bare patches of dirt with bark, sod or other material, or fence off area.
- › Dampen dusty soils before gardening.
- › Wear gardening gloves.
- › Do not eat or drink in contaminated areas.
- › Keep vegetable gardens away from old painted structures and treated wood.
- › Do not plant food crops under the roof overhang of your home.
- › Keep pets off of exposed dirt so they don't track it into the house.

For information and resources on arsenic and lead, contact Bonnie Meyer at 206-205-1150.

All information is general in nature and is not intended to be used as a substitute for appropriate professional advice. For more information please call (206) 296-4600 (voice/TDD).

Source: Public Health – Seattle & King County, "Environmental Health Hazard: Guidelines to reduce exposure to contaminated soils," <http://www.metrokc.gov/health/tsp/guidelines.htm>, updated Aug. 10, 2002.

Guidelines for Reducing Potential Exposure Everett Smelter Site

The highly contaminated soil over the original smelter has been covered, fenced or removed and **there is no immediate danger to human health**. However, it is uncertain what minimum level of long-term exposure to soil contaminated with arsenic, lead or cadmium poses a significant health risk. Therefore, **it is prudent to follow the precautionary health guidelines** outlined below.

Note that this advisory is not specific to any property. Concentrations of arsenic, lead, and cadmium in soil vary from location to location. Generally, higher levels of metals are found in the soil near the original smelter site and lower levels are found in outlying areas. Arsenic is the metal of most concern. Also note that large chunks of smelter slag found in the area are less hazardous than dust particles because dust can enter into the body more readily.

1. Children are more likely than adults to be exposed to arsenic, lead, and cadmium in soils and dust. Their exposure should be limited as much as practical.

- Children should not play in dirt. Play areas covered with grass or some other material will reduce a child's exposure.
- Encourage your children to wash their hands and faces after playing outdoors.
- Damp mop and dust your house frequently to reduce your child's contact with dust.

2. Avoid eating vegetables and fruit grown within the affected area.

- Lead and cadmium are known to accumulate in leafy vegetables such as lettuce, spinach, carrots, endive, cress, and beet greens. Onions, mustard, potatoes, and radishes have a moderate ability to uptake heavy metals from the soil.
- It is not known if these metals accumulate in blackberries or other fruit, so avoid eating them until more information is available. Metals were not found above the laboratory detection limits in apples tested from the site.
- If vegetables or fruit are consumed from local gardens, wash thoroughly before eating.

3. Use caution while working in the soil.

- Avoid all unnecessary exposure to soil or dust in the affected area.
- Spray the soil with water before and during the project to minimize dust. Do not saturate the soil or allow water to run off the site.
- Wear clean, full body protective clothing (coveralls or long sleeve shirt and pants), shoes and gloves (see page 9). For maximum protection wear a dust mask or other respiratory protection. Wash work clothes separately from other clothing.
- Don't eat, drink, smoke, or chew any material while in the work area.
- Clean surfaces by wet mopping, spraying with water, or vacuuming with a HEPA filter. Don't sweep or blow the surface.

4. Avoid other sources of metal exposure.

- Minimize children's exposure to hobbies that use lead (e.g., hobbies that involve the use of lead solder or paint).
- Make sure your child eats a well-balanced diet. Children who have acceptable iron and calcium intake, and low fat intake are less likely to absorb lead from their environment.
- Homes built before 1980 could have lead-based paint. Maintain the painted surfaces in your home to avoid exposure to lead paint chips and dust.
- If your job involves lead or lead compounds, shower and change clothes before returning home.

5. Construction activity.

- Employees of companies who are required to work in soil within the study area should refer to Good Practice Guidelines on page 9, and WAC 296-62 (the General Occupational Health Standard), or consult the Department of Labor and Industries for assistance on how to reduce work-related exposure to contaminated soil.
- Use heavy equipment that have enclosed cabs whenever possible.
- Soil removal from any site in the study area must be carried out in consultation with the Snohomish Health District. Soils in the area may have the potential to be designated as Dangerous Waste due to high metals content.

6. Pet precautions.

- Pets can come in contact with contaminated soil, which may then be carried into the home. If possible, keep pets out of areas of exposed soil. Inspect your yard and look for exposed soil your pet may have access to. Fill any holes where dogs may be digging as soon as it is noticed. If possible, restrict pet access from your house. Bathe your pets frequently. Wash your hands after handling your pet, and before preparing or eating food.

DRAFT

[Insert WSU Gardening Guidelines]

6. Range of Possible Actions to Address Area-Wide Soil Contamination

[Placeholder to insert text and diagram(s) describing the range of protective measures that might be taken to respond to area-wide soil contamination to complement the use of BMPs.]

7. Area-Wide Soil Contamination Contact List

Note: Contact information provided was correct as of the date of publication, but is subject to change.

Federal Agencies

Environmental Protection Agency

Region 10

- › <http://www.epa.gov/region10>
- › By Phone: 1-800-424-4372

Region 10 Office of Waste & Chemical Management

- › <http://yosemite1.epa.gov/R10/OWCM.NSF/webpage/homepage?opendocument>
- › (206) 553-8511

National Lead Information Center

- › <http://www.epa.gov/lead/nlic.htm>
- › By Phone: 1(800) 424-LEAD [5323].

Department of Housing and Urban Development

Seattle Regional Office

- › By Phone: (206) 220-5101
- › <http://www.hud.gov/local/index.cfm?state=wa>

Spokane Field Office

- › By Phone: (509) 353-0674
- › <http://www.hud.gov/local/index.cfm?state=wa>

Bureau of Reclamation

Pacific Northwest Region

- › <http://www.pn.usbr.gov/contact/index.shtml>.
- › By Phone: (208) 378-5020

Columbia Basin Civilian Conservation Center

- › (509) 762-2301

Ephrata Field Office

- › (509) 754-0214

Fort Simcoe Civilian Conservation Center, White Swan, WA

- › (509) 974-2244

Upper Columbia River Area Office

- › (509) 575-5848 ext. 202

State Agencies

Department of Ecology

Northwest Regional Office, Bellevue

› 425-649-7000

Southwest Regional Office, Lacey

› 360-407-6300

Central Regional Office, Yakima

› 509-575-2490

Eastern Regional Office, Spokane

› 509-329-3400

Tacoma Smelter Plume Environmental Cleanup Information

› http://www.ecy.wa.gov/programs/tcp/sites/tacoma_smelter/ts_hp.htm

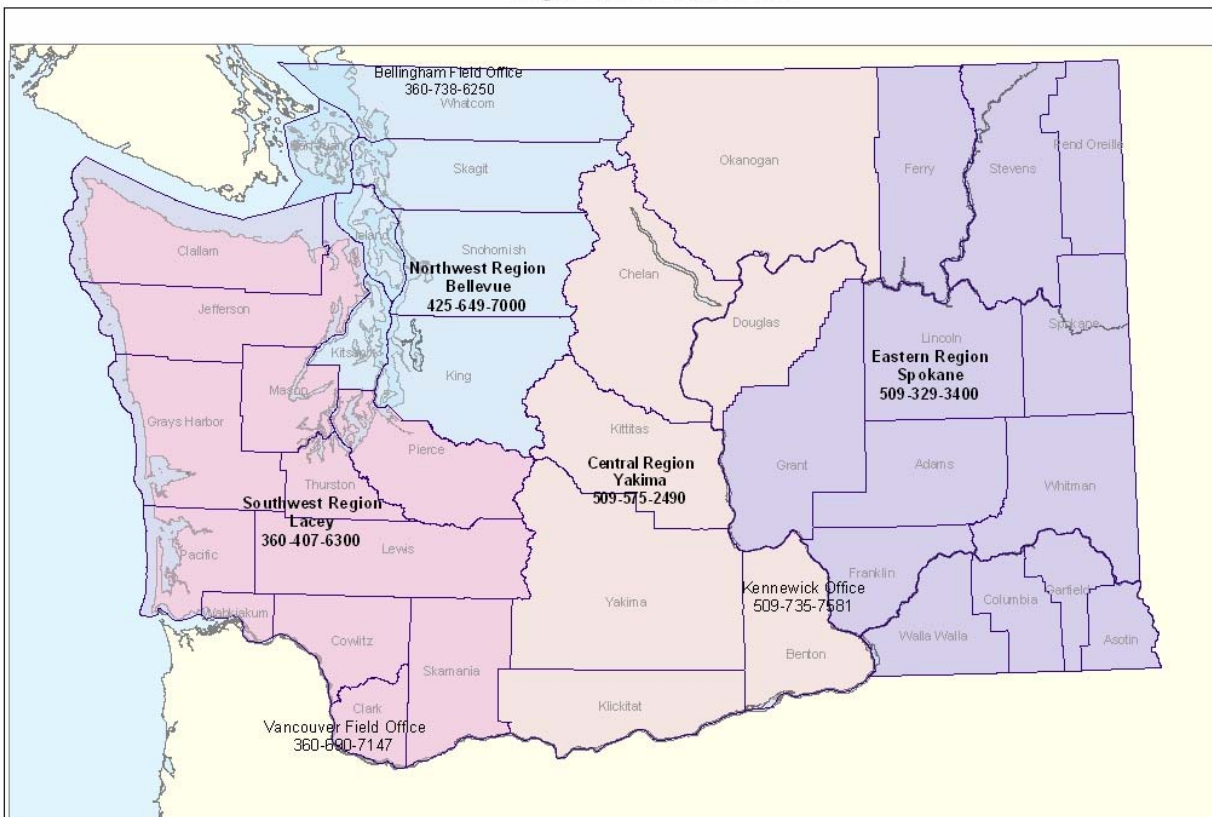
Area-Wide Soil Contamination Homepage

› http://www.ecy.wa.gov/programs/tcp/area_wide/area_wide_hp.html

Further contact information for all of Ecology's offices is available at <http://www.ecy.wa.gov/org.html>.

DRAFT

Washington State Department of Ecology Regional and Field Offices



Department of Health

- > <http://www.doh.wa.gov>
- > (800) 525-0127

Environmental Health Programs

- > <http://www.doh.wa.gov/ehp/default.htm>
- > (360) 236-3380

Office of Community Development

General Information

- > <http://www.ocd.wa.gov/>
- > 360-725-2800

Department of Agriculture

Pesticide Management Division

- > <http://www.wa.gov/agr/PestFert/default.htm>
- > 360-902-2010

Local Agencies

County Planning Departments and Health Districts

County	Agency Name & Website	Phone
<u>Adams</u>	Adams County Building and Planning Department http://www.co.adams.wa.us/departments/default.asp?DeptID=3	(509) 488-9441
	Adams County Health District http://www.co.adams.wa.us/departments/default.asp?DeptID=10	(509) 659-3321
<u>Asotin</u>	Asotin County Planning Department http://www.co.asotin.wa.us/ASOTIN/building.html	(509) 243-2020
	Asotin County Health District http://www.co.asotin.wa.us/ASOTIN/health.html	(509) 758 3344
<u>Benton</u>	Benton County Building/Planning Department http://www.co.benton.wa.us/planning.htm	(509) 786-5612
	Benton-Franklin Health District http://www.bfhd.wa.gov/	(509) 943-2614
<u>Chelan</u>	Chelan County Building, Fire Safety, and Planning http://www.co.chelan.wa.us/bl/bl1.htm	(509) 667-6225
	Chelan-Douglas Health District http://www.cdhd.wa.gov/index.asp	(509) 886-6400
<u>Clallam</u>	Clallam County Department of Community Development http://www.clallam.net/Departments/html/dept_dcd.htm	(360) 417-2420
	Clallam County Environmental Health Services http://www.clallam.net/EnvHealth/	(360) 417-2258
<u>Clark</u>	Clark County Department of Community Development http://www.co.clark.wa.us/ComDev/Default.asp	(360)397-2375
	Southwest Washington Health District http://www.swwhd.wa.gov/	(360) 397-8215
<u>Columbia</u>	Columbia County Planning Department http://www.columbiaco.com/	(509) 382-4541
	Columbia County Health District	(509) 382-2181
<u>Cowlitz</u>	Cowlitz County Department of Building and Planning http://www.co.cowlitz.wa.us/buildplan/default.htm	(360) 577-3052
	Cowlitz County Health Department http://www.co.cowlitz.wa.us/health/	(360) 414-5599
<u>Douglas</u>	Douglas County Department of Transportation and Land Services http://www.douglascountywa.net/departments/tls/	(509) 884-7173
	Chelan-Douglas Health District http://www.cdhd.wa.gov/index.asp	(509) 886-6400
<u>Ferry</u>	Ferry County Planning Department http://www.ferry-county.com/countygov.htm	(509) 775-5209
	Northeast Tri-County Health District http://homepage.plix.com/tricohealth/	(509) 684-1301
<u>Franklin</u>	Franklin County Planning and Building Department http://www.co.franklin.wa.us/planning/	(509) 545-3521

DRAFT

County	Agency Name & Website	Phone
	Benton-Franklin Health District http://www.bfhd.wa.gov/	(509) 943-2614
<u>Garfield</u>	Garfield County Commissioners	(509) 843-1391
	Garfield County Health District	(509) 843-3412
<u>Grant</u>	Grant County Planning Department http://www.grantcounty-wa.com/Planning/index.htm	(509) 754-2011
	Grant County Health District http://www.granthealth.org/index.htm	(509) 766-7960
<u>Grays Harbor</u>	Grays Harbor County Planning & Building Division http://www.co.grays-harbor.wa.us/info/pub_svcs/PlanningBuilding.htm	(360) 249-3203
	Grays Harbor County Environmental Health Division http://www.co.grays-harbor.wa.us/info/pub_svcs/envhealth.html	(360) 249-4413
<u>Island</u>	Island County Planning and Community Development http://www.islandcounty.net/planning/	(360) 678.5111
	Island County Health Department http://www.islandcounty.net/health/	(360) 679-7350
<u>Jefferson</u>	Jefferson County Community Development Department http://www.co.jefferson.wa.us/commdevelopment/default.htm	(360) 379.4450
	Jefferson County Health & Human Services http://www.co.jefferson.wa.us/health/default.htm	(360) 385.9400
<u>King</u>	King County Department of Development & Environmental Services http://www.metrokc.gov/ddes/	(206) 296-6600
	Seattle & King County Public Health http://www.metrokc.gov/health/ http://metrokc.gov/health/tsp/arsenic.htm	206) 296-4600
<u>Kitsap</u>	Kitsap County Department of Community Development http://www.kitsapgov.com/dcd/default.htm	(360) 337-7150
	Bremerton-Kitsap County Health District http://www.wa.gov/kitsaphealth/	(360) 337-5235
<u>Kittitas</u>	Kittitas County Planning Office http://www.co.kittitas.wa.us/planning/default.asp	(509) 962-7506
	Kittitas County Public Health Office http://www.co.kittitas.wa.us/health/default.asp	(509) 962-7515
<u>Klickitat</u>	Klickitat County Planning Department http://www.klickitatcounty.org/Planning/	(509) 773-5703
	Klickitat County Health Department http://www.klickitatcounty.org/Health/	(509) 773-5991
<u>Lewis</u>	Lewis County Community Development Division http://www.co.lewis.wa.us/CommunityDevelopment/commdev.htm	(360) 740-1146
	Lewis County Health Department http://www.co.lewis.wa.us/HealthSocialServices/Health.htm	(360) 740-1223
<u>Lincoln</u>	Lincoln County Planning Department	(509) 725-7041
	Lincoln County Public Health Department http://www.co.lincoln.wa.us/	(509) 725-2500

DRAFT

County	Agency Name & Website	Phone
<u>Mason</u>	Mason County Department of Community Development http://www.co.mason.wa.us/community_dev/default.shtml	(360) 427-9670 Ext. 352
	Mason County Environmental Health Department http://www.co.mason.wa.us/envhealth/default.shtml	(360) 427-9670 Ext. 352
<u>Okanogan</u>	Okanogan County Office of Planning & Development http://www.okanogancounty.org/planning/index.html	(509) 422-7160
	Okanogan County Health District http://www.okanogancounty.org/ochd/index.htm	(509) 422-7140
<u>Pacific</u>	Pacific County Department of Community Development http://www.co.pacific.wa.us/dcd/index.htm	(360) 875-9356
	Pacific County Environmental Health Division http://www.co.pacific.wa.us/dcd/ENVHEALTH.htm	(360) 642-9382
<u>Pend Oreille</u>	Pend Oreille Planning Department	(509) 447-4821
	Northeast Tri-County Health District http://homepage.plix.com/tricohealth/	(509) 684-1301
<u>Pierce</u>	Pierce County Planning and Land Services http://www.co.pierce.wa.us/pc/services/home/property/pals/palsmain.htm	(253) 798-7210
	Tacoma-Pierce County Health District http://www.tpchd.org/ http://www.healthdept.co.pierce.wa.us/eh/arsenic.htm	(253) 798-6500
<u>San Juan</u>	San Juan County Planning Department http://www.co.san-juan.wa.us/planning/index.html	(360) 378-2393
	San Juan County Department of Health and Community Services http://www.co.san-juan.wa.us/apages/health.html	(360) 378-4474
<u>Skagit</u>	Skagit County Planning and Permit Center http://www.skagitcounty.net/Common/asp/default.asp?d=PlanningAndPermit&c=General&p=main.htm	(360) 336 -9410
	Skagit County Health Department http://www.skagitcounty.net/Common/asp/default.asp?d=Health&c=General&p=main.htm	(360) 336-9380
<u>Skamania</u>	Skamania County Planning and Community Development Department http://www.skamaniacounty.org/Planning%20and%20Development%20Department.htm	(509) 427-9458
	Southwest Washington Health District http://www.swwhd.wa.gov/	(360) 397-8215
<u>Snohomish</u>	Snohomish County Department of Planning & Development Services http://www.co.snohomish.wa.us/pds/index.asp	(425) 388-3311
	Snohomish Health District http://www.snohd.org/	(425) 339.5210
<u>Spokane</u>	Spokane County Planning Department http://www.spokanecounty.org/planning/	(509) 477-7200
	Spokane Regional Health District http://www.spokanecounty.org/health/index.asp	(509) 324-1500
<u>Stevens</u>	Stevens County Planning Department http://www.co.stevens.wa.us/planning/Index.htm	(509) 684-2401

DRAFT

County	Agency Name & Website	Phone
	Northeast Tri-County Health District http://homepage.plix.com/tricohealth/	(509) 684-1301
<u>Thurston</u>	Thurston Regional Planning Council http://www.trpc.org/	(360) 786-5480
	Thurston County Public Health & Social Services Department http://www.co.thurston.wa.us/health/welcome.html	(360) 786-5581
<u>Wahkiakum</u>	Cowlitz-Wahkiakum Council of Governments, Wahkiakum County Planning Department http://www.cwcog.org/building.html	(360) 577-3041
	Wahkiakum County Health & Human Services http://www.cwcog.org/humanservices.html	(360) 795-6207
<u>Walla Walla</u>	Walla Walla County Regional Planning http://www.co.walla-walla.wa.us/Departments/planning/regional-plan/regional_planning.htm	(509) 527-3285
	Walla Walla County Health Department http://www.co.walla-walla.wa.us/Departments/health/health.htm	(509) 527-3290
<u>Whatcom</u>	Whatcom County Planning & Development Services http://www.co.whatcom.wa.us/PDS/home.htm	(360) 676-6907
	Whatcom County Health Department http://www.co.whatcom.wa.us/Health/home.htm	(360) 676-6720
<u>Whitman</u>	Whitman County Department of Public Works http://www.whitmancounty.org/PubWorks/	(509) 397-6206
	Whitman County Department of Public Health http://www.whitmancounty.org/PubHealth/	(509) 397-6280
<u>Yakima</u>	Yakima County Planning Department http://www.pan.co.yakima.wa.us/Planning/Default.htm	(509) 574-2230
	Yakima County Department of Public Health http://www.co.yakima.wa.us/health/default.html	(509) 575-4040